

## Supporting Self-Regulation by Personal Learning Environments

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**In this paper we attempt to address the issue of supporting self-regulation by Personal Learning Environments (PLE), which provide the learner with a freedom to design and compose his or her learning environment according to personal preferences and context demands. Psychology and neuroscience offer a lot of highly relevant results that should be taken into account. We report on our experiments mainly with PhD students, which represent a community of advanced learners. This needs to be considered when interpreting their feedback, as for most of the learners is self-regulation even more challenging. Even students at this high level appreciate pedagogical support in the learning process.**

*Keywords: self-regulated learning, personal learning environment.*

### I. INTRODUCTION

*Self-Regulated Learning* (SRL) [1] means overtaking the responsibility by the learner for his or her own learning process, its self-monitoring, and control aiming at learning objectives. From the psychological perspective the learner must use both cognitive and meta-cognitive strategies. The cognitive ones focus on processing of learning materials, while the meta-cognitive ones deal with the application of cognitive strategies, i.e. their planning, monitoring, and regulation. Self-regulation includes cognitive, motivational, and contextual processes. Research suggests that the quality of application of the cognitive learning strategies is crucial for successful learning and that it can be improved by training. From the implementation point of view the concept *Personal Learning Environment* (PLE) is in line with the SRL requirements. PLE describes the tools, communities, and services that constitute the individual educational platforms that learners use to direct their own learning and pursue educational goals. Compared to course-centric solutions (like Learning Management Systems) PLE is learner-centric, i.e. students are in charge of their learning process, emphasizing meta-cognition in learning.

In the following first several important outcomes from the areas of psychology and neuroscience are mentioned. Then an overview of the input collected in one survey and one workshop is presented. Finally, key conclusions are outlined.

### II. PSYCHOLOGY AND NEUROSCIENCE OUTCOMES

The power of agency plays a crucial role when motivation in learning is considered [2]. It has been

confirmed that we have to be the ones making the decision in order to value it more after committing to it. This is a big problem of the traditional educational system and at the same time a key challenge for SRL.

Another important finding is that self-regulatory competences can be recognized very early and have a high impact on successful learning during the whole life. Variations of the self-imposed delay-of-gratification situation in preschool were compared to determine when individual differences in this situation may predict aspects of cognitive and self-regulatory competence in adolescence. Correlations were found between delay time in such conditions in preschool and cognitive competence and ability to cope with stress in adolescence [3]. This suggests the necessity of early cultivation of self-regulatory skills.

So a typical problem related to self-control of humans is giving up on our long-term goals for immediate gratification, which is called procrastination. When people recognize their self-control problems, they try to control them by self-imposing deadlines. These deadlines help people control procrastination, but they are not as effective as some externally imposed deadlines in improving task performance [4]. This may seem to be in conflict with the power of agency, but can be explained simply by suboptimal self-imposed plans compared to the one given by the teacher.

### III. JTEL SUMMER SCHOOL SURVEY

In 2010 we conducted a survey to test the impact of choice architecture on the responses of people and to find out what PhD students think on some issues in TEL. For our survey on present learning we prepared 10 statements on 4 issues (respondents got the statements in a mixed order, but we cluster them here). Our aim was to formulate them in a way that would show us clearly the unbiased opinions of respondents. 31 participants, mostly PhD students, responded to the statements using a five point Likert Scale. Here we present an overview of 3 issues closely related to SRL.

The Figures 1-3 show that our respondents (advanced learners) mostly think that too much freedom for the learner may be overwhelming and contra productive. Similarly, they agree that learners require pedagogical assistance. Finally, almost all of them appreciate availability of a competent tutor. In addition to these findings we can easily see how important it is to find a right formulation of a statement in order to achieve a common understanding. Slight changes in wording may dramatically change responses. At the same time this demonstrates that to identify real opinions and

preferences of people may be a tricky issue and choice architecture can influence them essentially.

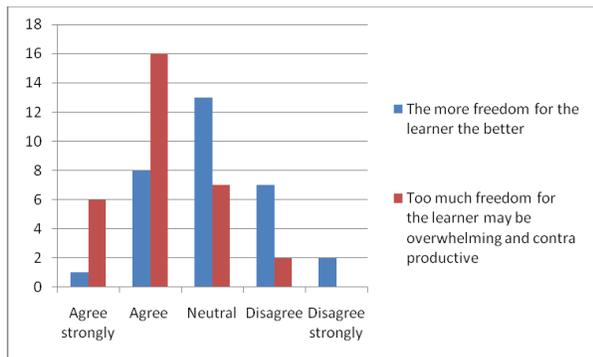


Figure 1. Freedom of Learner.

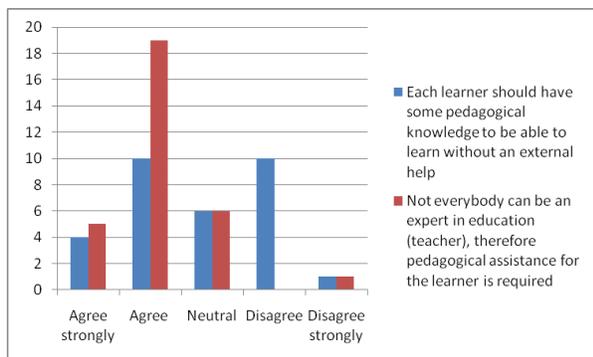


Figure 2. Pedagogical Support.

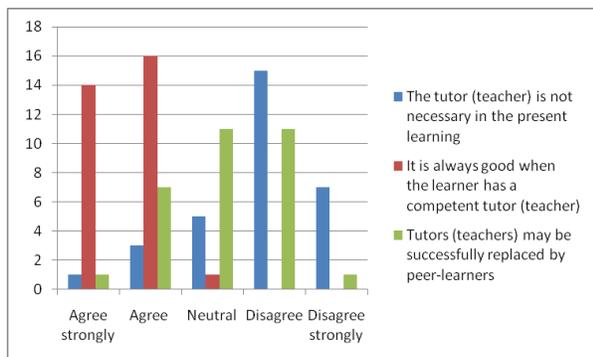


Figure 3. Necessity of Tutors (Teachers).

#### IV. JTEL SUMMER SCHOOL WORKSHOP

At the JTEL Summer School in May 2011 we organized the workshop “Psychology-informed Design, Usage & Development of Responsive Open (Personal) Learning Environments”. The participants received a lecture on the topic, explaining cognitive biases of humans, principles of choice architecture, and libertarian paternalism as a possible solution. This was followed by hands-on session for the target group of learners in order to experience how to assemble a personal learning environment (PLE) and how to use it. The participants worked in 3 groups, each with 5-6

PhD students and one tutor. The task was to prepare a paper prototype based on the design principles explained previously and then to create a PLE. The groups chose practical themes, like Summer School, PhD study, and collaborative writing of research papers. They identified required services and created a paper mockup. Then they tried to find the needed widgets in the ROLE Widget Store and to assemble a PLE using iGoogle as a container. At the end they presented their solutions. The PhD students understood the approach quickly and managed their tasks without bigger problems. As the ROLE Widget Store was not very populated, it was not always easy to find a suitable solution for each service. This leads to the question why not to use the Chrome Web Store instead, which indicates the necessity of populating the ROLE Widget Store and showing its pedagogical benefits to the users.

#### V. CONCLUSIONS

Based on the collected input from the above mentioned events and other related workshops that we co-organized (SRL-ROLE at ICALT 2011 and PALE at UMAP 2011 [5]), several conclusions can be made. First of all, due to the traditional teaching approaches, SRL is a challenge, but also a must for successful people. They have to learn relevant meta-cognitive skills early enough, which is suggested also by the above mentioned outcomes from psychology and neuroscience. In this process, suitable scaffolding has to be taken into account. A good SRL solution should be personalized and adaptive, providing a right balance between the learner’s freedom and guidance, in order to motivate the learner, but also to support his or her when needed. This threshold is individual and context dependent. A spectrum of facilities is needed for various types of SRL at different levels of education and in different contexts (e.g. cultural). These facilities need to be exploited accordingly.

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